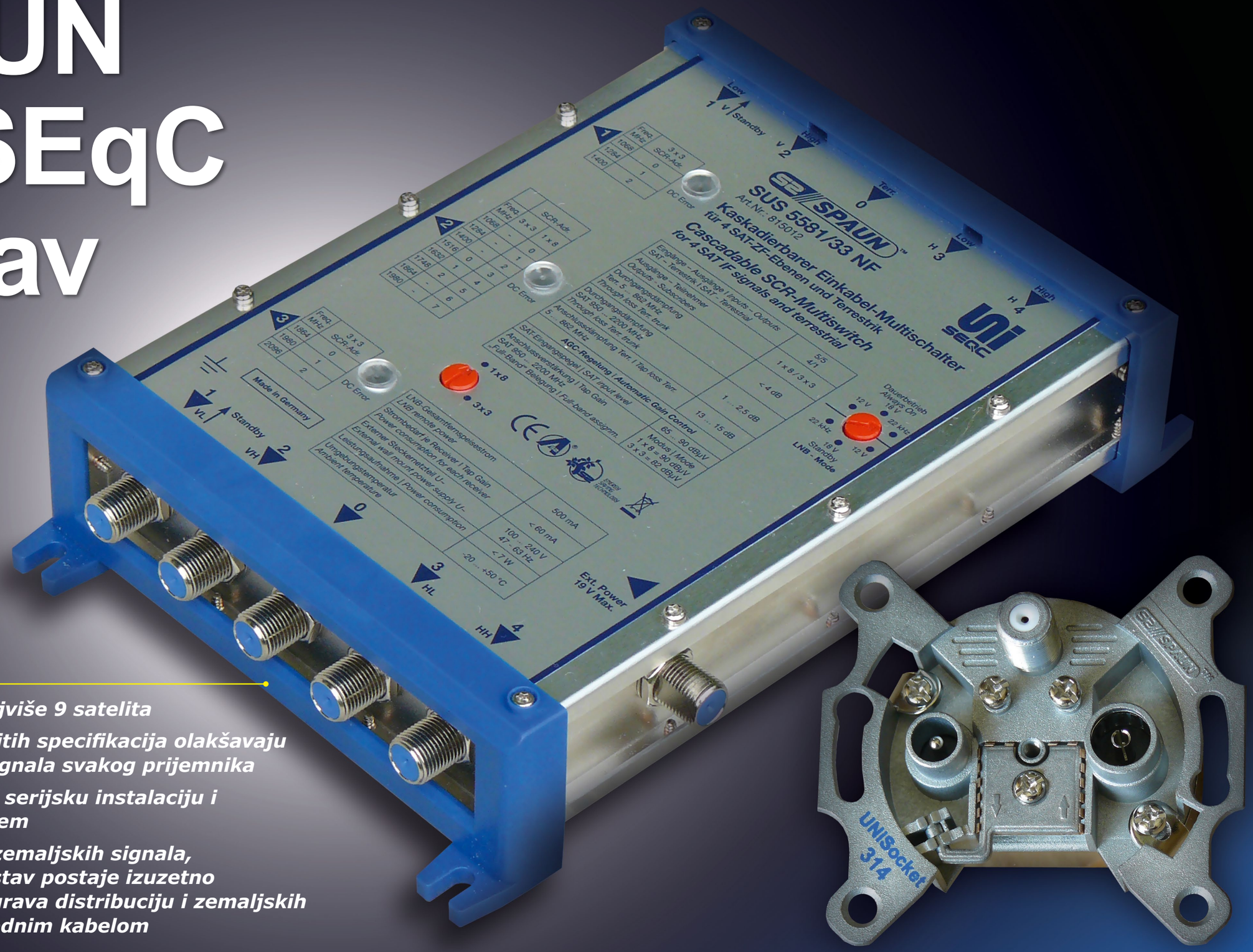
# SPAUN UNiSEqC sustav




- *moguće spajanje najviše 9 satelita*
- *zidne utičnice različitih specifikacija olakšavaju podešavanje razine signala svakog prijemnika*
- *sustavi omogućuju i serijsku instalaciju i instalaciju sa grananjem*
- *moguće dodavanje zemaljskih signala, zahvaljujući čemu sustav postaje izuzetno ekonomičan, jer osigurava distribuciju i zemaljskih i satelitskih signala jednim kabelom*

# SPAUN SUS 5581/33 NF

## A very Easy-to-Install Satellite TV Signal Distribution


Satellite TV is so easily accessible today that more and more often you have not just one receiver in the living room but two or more of them located in different rooms of your apartment or house. Today's higher class PVR receivers have usually two satellite tuners and to take full advantage of this feature, you should connect two independent coax cables to them. How many of us were so clever 10 years ago or earlier to foresee the need for that many cables?

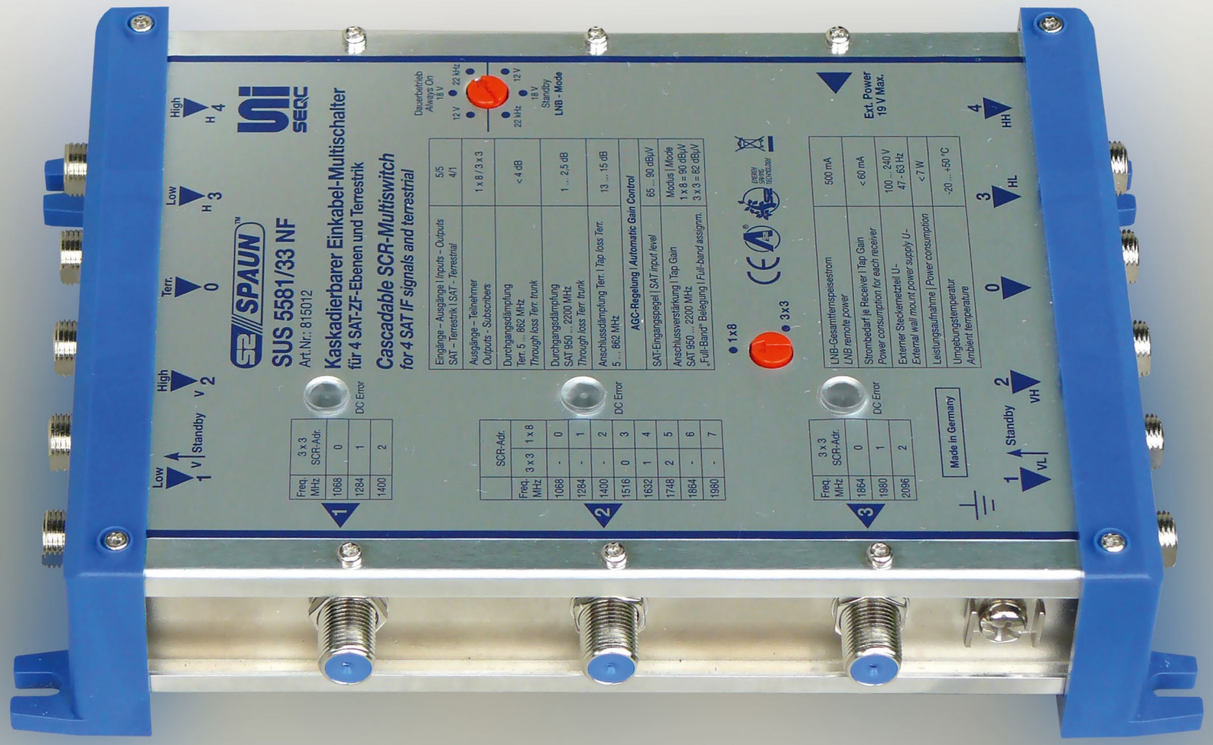
To solve this kind of problems as well as to keep the cabling as simple as possible, a solution called SCR can be used. SCR stands for Satellite-Channel-Router and this is a European industry standard for distributing satellite signals over a single coaxial cable - CENELEC EN50494.

SPAUN use their own trademark UNiSEqC to mark their products dedicated for this solution. We asked SPAUN to send us samples of their UNiSEqC products so that we could test them and inform our readers what they should expect when applying them.

As usually, SPAUN had been very responsive and we received their products very soon. It was the SUS 5581/33 NF cascadable SCR Multiswitch and a number of wall sockets dedicated for the system. The sockets were of three different types: UNiSocket 310, 314 and 318.

Let us first describe the heart of the system – SCR multiswitch. SUS 5581/33 NF accepts either LNB Quattro or LNB Quad signals plus a signal from a terrestrial antenna. You can configure the multiswitch to generate a SCR signal either on one output or on three outputs. If you choose one output, you use only one coaxial cable on which you can hook up as many as eight UNiSockets. The system with three outputs lets you connect up to three sockets on each of the three coax cables. So, in the first configuration you can connect 8 independent receivers and in the second configuration – 9 receivers.

You must though keep in mind that all receivers used in this system must be compatible with SCR technology. If SCR is not clearly stated in the receiver specification, check if EN 50494 standard is mentioned or a term "unicable" (another trademark for a SCR solution). If you can put your hands on the receiver in question,



enter its installation menu and check if you can set its LNB to "SCR" "UNiSEqC" or "Unicable" type. The menu should also offer you the possibility to program the SCR frequencies or to detect them automatically.

During the system configuration, we need to assign a unique SCR frequency to each receiver. Two receivers can not operate on the same frequency. When using SUS 5581/33 NF in one output configuration, the available frequencies are: 1068, 1284, 1400, 1516, 1632, 1748, 1864 and 1980 MHz. The best idea is to assign the lowest frequency (1068 MHz) to the receiver which is the last one on the cable and thus must overcome the highest cable attenuation. Cable attenuation increases with frequency, so to make "life easier" for the last receiver, we should keep its operating frequency as low as possible. Of course the last but one receiver should work on 1284 MHz and so on. The very first one should operate on 1980 MHz.

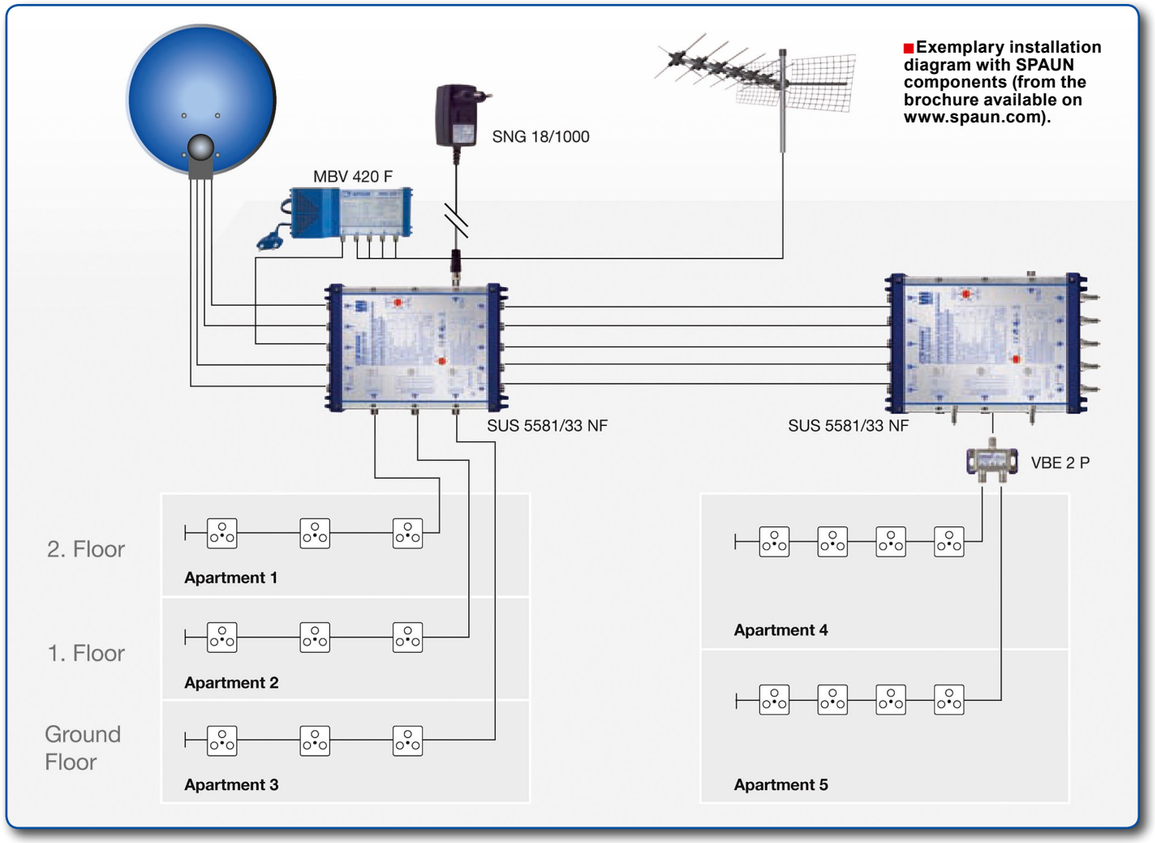
If a three cable installation makes more sense in your particular location, the following frequencies are available: 1068, 1284 and 1400 MHz on output no. 1, 1516, 1632 and 1748 MHz on output no. 2 and 1864, 1980 and 2096 MHz on output no. 3. Of course, the laws of physics do not change when you use this configuration, so use output no. 3 for the shortest cable and output no. 1 for the longest cable. And, as explained above, the further is the receiver from the SCR multiswitch the lower should be its operating frequency.

All these frequencies are not only listed in the well written and detailed user guide but also on the top cover of the SUS 5581/33 NF. Like all other SPAUN multiswitches, also this unit is perfectly finished off and its labels could not be more self-explanatory. You can see it for yourselves in the pictures presented alongside this report.

The SCR multiswitch is cascadable what means that you can connect another SUS 5581/33 NF to the trunk outputs and increase the number of the receivers in the installation. Of course, each receiver (or receiver tuner) will be fully independent and capable of receiving any channel from the satellite your antenna, equipped witha Quad or Quattro LNB, is aimed at. While one multiswitch should be a sufficient solution for a family house, you may need to cascade a few multiswitches to serve a multistory building.

Speaking of the distribution system configuration, it is worth mentioning that you are not limited to either 1x8 or 3x3 configurations. For example, if you split the single output to two lines, you can get the configuration 2x4. You only need to remember that the splitter must support the IF frequency range (950-2150 MHz) and have a DC pass. This is clearly explained in the user guide.

An important thing you should remember is that the input signal from Quad or Quattro type LNB should be rather high (65~90 dBµV). This is not a problem if you are going to receive a strong European satellite like ASTRA 1 on 19.2° and you have enough room to install 90 cm dish, but if this is a weaker satellite, you should think of either a bigger dish (what is always advisable for a "collective" reception) or an additional amplifier between LNB and SCR multiswitch input.




**Exemplary installation diagram with SPAUN components (from the brochure available on www.spaun.com).**

A valuable feature of the SUS 5581/33 NF is its versatility in powering it up. SPAUN supplies a wall mount power supply unit but if this is not practical in your installation, you can power the multiswitch via its terrestrial trunkline. By the way, the included power supply unit have a convenient plug adapters what combined with its high input voltage range (100-240, V 50/60 Hz) makes it truly worldwide. There are also 5 pieces of 75 ohm terminators included in the package. You attach them to the trunk outputs if they are not used for cascading.

Although the UNiSockets are much simpler products than the SCR multiswitch, their performance also counts in the whole system. We got tree socket types. Although they look identical except for the type number printed on them, they differ in the insertion and tap losses. UNiSocket 310 has the lowest tap loss – only 10 dB, but its insertion loss is the highest from the three models – 3 dB. You'd better choose this model for the most distant socket from the SCR switch. Model 318 has the highest tap loss – 18 dB but the lowest insertion loss – only 1.5 dB. This model should be considered for the sockets located close to the SCR multiswitch. UNiSocket 314 is an interim model with moderate tap loss – 14 dB and insertion loss – 2 dB. All those parameters are the typical values and according to the product specifications, you should be ready to accept +/- 2 dB tolerance of the tap loss for every model.

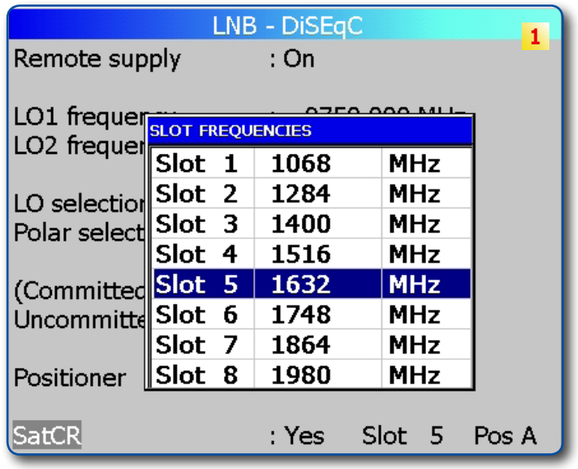
We started our tests with measuring the sockets. The results were very satisfactory for the insertion loss – all three models had lower average loss than specified. Model 310 had the average insertion loss 2.49 dB, model 314 – 1.99 dB and model 318 – 1.66 dB. The loss variation was small in the whole IF frequency range (950-2150 MHz). We can say that the sockets were 0.5 dB better than specified.

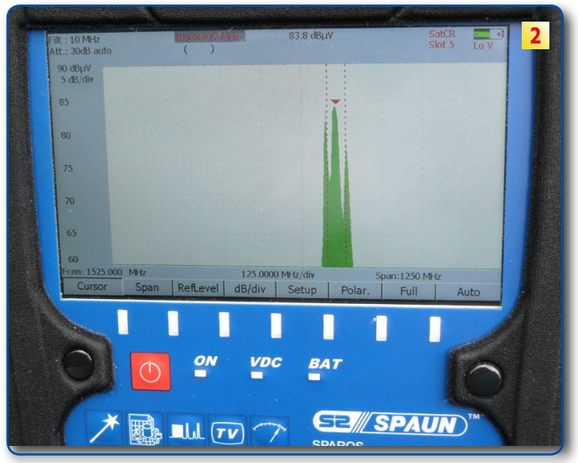
When we took the measurements of the tap loss, the average results were still in the specifications: 11.96 dB for 310, 15.85 dB for 314 and 17.98 dB for 318. but slightly higher than typical value.

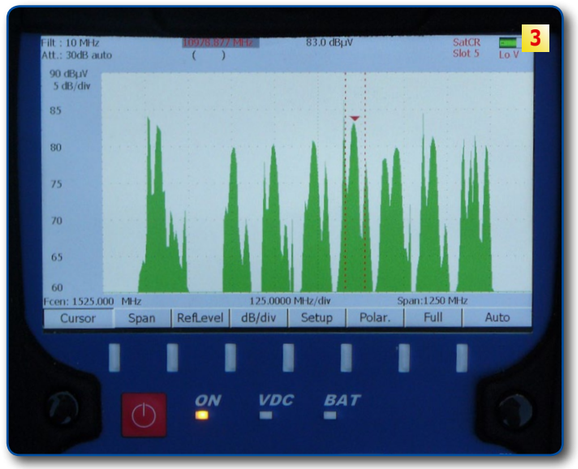
We built a test distribution system then. A high output power quad LNB was driving our SUS 5581/33 NF. Later, we switched to a Quattro LNB and everything worked equally good. The SCR multiswitch was configured for one output. We connected a quite long cable (over 30 meters) to its output. The first UNiSocket 318 was connected to the cable end and after this socket we connected the other seven ones: 2 x 318, 3 x 314 and 2 x 310. Between the sockets we connected cables of various lengths: from 30 cm to 6 meters. The whole system from the SCR multiswitch to the last socket measured about 50-55 meters.

A cable of such length attenuates the signal by about 15 dB and usually does not pose a problem for a normal satellite reception in which an LNB is routed directly to a receiver. However, in our case, every socket installed on the cable added its attenuation (insertion loss). The SCR multiswitch has automatic gain control that regulates its output signal to about 90 dBµV output if only the input signal from the Quad or Quattro LNB is in the range 65-90 dBµV. The above table presents the signal levels we achieved at each of the sockets.

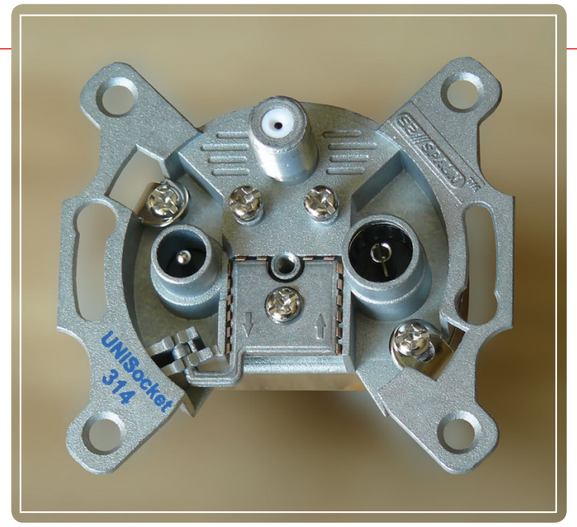
We were quite anxious when we connected our receiver. Would it be able to lock to the signal? We used a modern Icecrypt STC6000 HDPVR. The receiver was locking to the signal and showing channel video without any problem, no matter to which socket we connected it and which SCR frequency we chose. Its

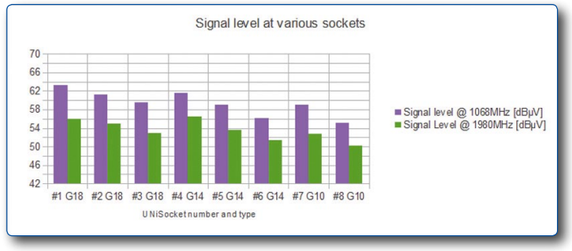



**1. SPAROS Signal Analyzer detected correctly all eight SCR frequencies when connected to SUS 558133 NF SCR Multiswitch.**
**2. The lowest SCR frequency (1068 MHz) activated – measured directly at the output of SUS 558133 NF SCR Multiswitch.**
**3. All but one SCR frequencies activated on the output number 2 of SUS 558133 NF SCR Multiswitch in the single cable mode.**




signal strength was at 90% and signal quality at 80%. Not bad, not bad at all, if you take into account that the signal was attenuated by a long cable and the sockets.

However, in real life, you do not always have the most modern receivers well prepared for the SCR system. Therefore, we decided to check how an old receiver would perform. We took a 5 years old receiver with SCR feature. At that time it was quite a novelty. We were full of doubts if it will be able to lock to the signal when connected to the last socket but to our surprise, it had no problem at all, neither at the lowest frequency (1068 MHz) nor at the highest (1980 MHz).

But what you should do if your cable installation is longer than that in our test setup (about 55 meters)? The solution is quite simple. Use an inline satellite signal amplifier. When we connected the SPAUN SVN 231 F amplifier, it boosted the signal by 30 dB. Signal level measured at the last G10 socket at 1980 MHz rose from 50.2 dBµV to 80.6 dBµV. With such amplifier you can add another 100 meters of coaxial cable and have in total over 150 meters! And mind that with a single amplifier you boost the signal for all eight receivers!

When we switched the SUS 5581/33 NF to 3x3 mode, its output signal is regulated to about 80 dBµV. We checked output no. 3 in the similar setup. This output generates the highest frequencies and thus is most sensitive to cable losses. Total cable length was about 45 meters and we used G18, G14 and G10. Signal level measured at their outputs was respectively: 52.7, 54.2 and 56.5 dBµV and of course our receivers had absolutely no problem in locking to the signal.

But this was not the end of our test. SPAUN claims in their user guide that "By internal electronics of the device, the use of special protection sockets (with shut-down on reception of non-standard DiSEqC commands to EN 50494) is not necessary." Such statement is nothing but a challenge for a dedicated tester.

So, apart from the EN 50494 compatible receivers, we connected a classical receiver to the single cable system built with SPAUN components and operated it in such a way to make it send various DiSEqC commands (1.0, 1.1 and 1.2). We were changing reception system configuration in the receiver menu and then zapping channels.

And indeed, in line with SPAUN's promise, nothing could disturb the operation of UniSEqC compatible receivers. They continued to deliver undistorted video and audio. We know, however, that not every SCR system offered on the market has so advanced routers as SPAUN. So the SPAUN UNiSEqC offers the additional advantage of being foolproof against users connecting regular receivers or badly configured receivers - SPAUN's system simply ignores these commands and keeps working perfectly.

The UNiSEqC system, once configured, works reliably without any maintenance. After a power shortage, the receivers boot and send commands to the SCR multiswitch to activate "their" frequencies. Everything starts to work again.

We are sure that this is the simplest and cheapest solution to make an existing installation suitable for twin tuner receivers with only one cable entering every room. The system is also attractive for new installation as the complexity of cabling is significantly reduced. You can easily combine classical multiswitches and the UNiSEqC system. Several wiring examples are provided in the user guide. The only precondition is: you must use SCR compatible receivers. Fortunately, more and more new receivers are equipped with this feature.

## Expert Opinion

**Jacek Pawlowski**
TELE-satellite
Test Center
Poland

**+**

**Very good workmanship of the SUS 5581/33 NF and the UNiSockets.**
**Simple installation and trouble free operation.**
**SCR switch cascadable not only with identical products but also with classical multiswitches.**
**Possibility to power the switch via the terrestrial trunkline.**
**Low insertion loss of the UNiSockets**

**–**

**None**

## TECHNICAL DATA

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|---|---|
| **Manufacturer** | SPAUN electronic GmbH & Co. KG, Germany |
| **Web** | www.spaun.com |
| **E-mail** | contact@spaun.com |
| **Phone** | +49 (0)7731 - 8673-0 |
| **Fax** | +49 (0)7731 - 8673-17 |
| **Model** | SUS 5581/33 NF |
| **Function** | SCR Multiswitch compatible with EN50494 |
| **Inputs** | 4 satellite (LNB Quattro or Quad)+ 1 terrestrial |
| **Tap outputs** | 1 or 3 (switchable: 1x8 or 3x3) |
| **Trunk outputs** | 5 |
| **Through loss** | 1~2.5 dB for IF and <4 dB for terrestrial signal |
| **Terrestrial tap loss** | 13~15 dB |
| **SAT input signal** | 65~90 dBµV |
| **SAT tap output** | 90 dBµV for 1 x 8 output<br>82 dBµV for 3 x 3 outputs |
| **LNB remote current** | 500 mA |
| **Power consumption** | < 7 W |
| **Ambient temperature** | -20~+50° C |